Suisun Marsh Monitoring Program
Channel Water Salinity Report

Reporting Period: January 2005

Questions regarding this report should be directed to:

Jim Sung
California Department of Water Resources
Division of Environmental Services
3251 S Street
Sacramento, CA 95816-7017

Telephone: (916) 227-7520
sung@water.ca.gov

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1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT

As per SWRCB Water Rights Decision 1641, dated December 29, 1999, and previous SWRCB decisions, the California Department of Water Resources (DWR) is required to provide monthly channel water salinity compliance reports for the Suisun Marsh to the SWRCB. Conditions of channel water salinity in the Suisun Marsh are determined by monitoring specific electrical conductivity. Specific electrical conductivity is referred to in the reports as "specific conductance". The locations of all listed stations are shown in Figure 5.

The monthly reports are submitted for October through May each year in accordance with SWRCB requirements. The reports are required to include salinity data from the stations listed below:

Station Identification	Station Name	General Location	Classification
C-2*	Collinsville	Western Delta	Compliance Station
S-64	National Steel	Eastern Suisun Marsh	Compliance Station
S-49	Beldon's Landing	North-Central Suisun Marsh	Compliance Station
S-42	Volanti	North-Western Suisun Marsh	Compliance Station
S-21	Sunrise	North-Western Suisun Marsh	Compliance Station

Data from the stations listed below are included in the monthly reports to provide information on salinity conditions in the western Suisun Marsh.

Station Identification	Station Name	General Location	Classification
S-97	Ibis	Western Suisun Marsh	Monitoring Station
S-35	Morrow Island	South-Western Suisun Marsh	Monitoring Station

Information on Delta outflow, area rainfall, and operation of the Suisun Marsh Salinity Control Gates are also included in the monthly reports to provide information on conditions that may affect channel water salinity in the Marsh.

* Throughout the report, the representative data from nearby USBR station is used in lieu of data from station C-2.

2. Monitoring Results

2.1 Channel Water Salinity Compliance

During the month of January, 2005, salinity conditions at all five compliance stations are in compliance with channel water salinity standards of SWRCB (Table 1). Compliance with standards for the month of January was determined for each compliance station by comparing the progressive daily mean of high-tide specific conductance (SC) with respective standards. The standard for compliance stations C-2, S-64, S-49, S-42 and S-21 were 12.5 mS/cm during January 2005. Table 1 lists monthly mean high-tide SC at these compliance stations. The progressive daily mean (PDM) is the monthly average of both daily high-tide SC values. The mathematical equation is shown below.

$$\text{PDM} = \frac{\sum \text{daily average of high tide SC}}{\text{\# days of the month}}$$

2.2 Delta Outflow

The January Delta outflow ranged between 9,200 cfs to 62,000 cfs. Outflow started off above 50,000 cfs for the first week of January, then dropped to about 30,000 cfs by January 8, 2005. Continued precipitation resulted in increased runoffs and outflow to increase between January 9 to 12, 2005, with a maximum outflow peak of about 45,000 cfs during this period. Thereafter, outflow decreased as a result of no precipitation to a low of about 10,000 cfs on January 26, 2005. Outflow increased again as a result of more precipitation and ended the month at about 30,000 cfs. The monthly Delta outflow is represented by the mean Net Delta Outflow Index (NDOI). The NDOI is the estimated daily average of Delta outflow. Mean NDOI for January is listed below:

Month	Mean NDOI (cubic feet per second)
January	30,798

2.3 Rainfall

Total monthly rainfall at the Waterman Gauging Station in Fairfield during January 2005 was about 1 inch less than the previous month December total and is listed below: The largest precipitation occurred on January 27 with the daily total of 0.80 inches.

Month	Total Rainfall (inches)
January	5.52

2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock installations at the SMSCG during January 2005 is summarized below. The gates continued to be operated to control salinity with boat lock open configuration per NOAA request for the remainder of the control season.

Date	Gate status	Flashboards status	Boat Lock status
January 1-13	2 gates operating	Installed	Open
January 14-31	1 gate operating	Installed	Open

During January 2005, the SMSCG operation was with only 2 gates through January 13. On January 14, 2005, Gate # 3 cable malfunctioned and as a result, only 1 gate (i.e. Gate #2) was functional for the remainder of the month.

3. Discussion

3.1 Factors Affecting Channel Water Salinity in the Suisun Marsh

Factors that affect channel water salinity levels in the Suisun Marsh include:

- delta outflow;
- tidal exchange;
- rainfall and local creek inflow;
- managed wetland operations; and,
- operation of the SMSCG and flashboard configurations.

3.2 Observations and Trends

3.2.1 Conditions during the Reporting Period

During January 2005, salinity levels at Collinsville(C-2), National Steel(S-64), Beldons (S-49), Sunrise Club(S-21), and Volanti(S-42) were no higher than 8.0 mS/cm as shown in Figure 1. At the two monitoring stations, S-97 salinity levels ranged from 4.0 mS/cm to 6.0 mS/cm, and S-35 ranged from 6.0 mS/cm to 11.0 mS/cm, as shown in Figure 2. Salinity levels at the eastern marsh stations dropped in early January and continued to remain low for the remainder of the month. At the two northwestern stations (i.e. S-42 and S-21) salinity levels also declined in early January, but not until a few days later after the salinity drop at the eastern stations due to the proximity of the stations being further away from the bay and take longer for outflow to have an effect in that area. By mid-January, all compliance and monitoring stations salinity levels were so fresh that they leveled out for the rest of the month.

On the western side of the marsh, Ibis salinity level started off low in January and continues to remain low for the rest of the month due to good amount of precipitation which resulted in creek runoffs. Morrow salinity levels also declined but still higher than Ibis and at a slower rate as shown in Figure 2. It was not until mid-January where salinity levels dropped significantly at Morrow to about 7.0 mS/cm and remained at this level for the rest of January.

Overall, salinity levels were well below standards at all compliance and monitoring stations.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high-tide SC at the compliance and monitoring stations for January 2005 were compared with means for those months during the previous nine years (Figure 4).

Means salinity pattern of all compliance and monitoring stations are similar to that of 2003, but somewhat higher in magnitude. Compared to previous nine years, January 2005 salinity levels were ranked sixth in high Specific Conductance.

Table 1

Monthly Mean High Tide Specific Conductance at Suisun Marsh Water Quality Compliance Stations

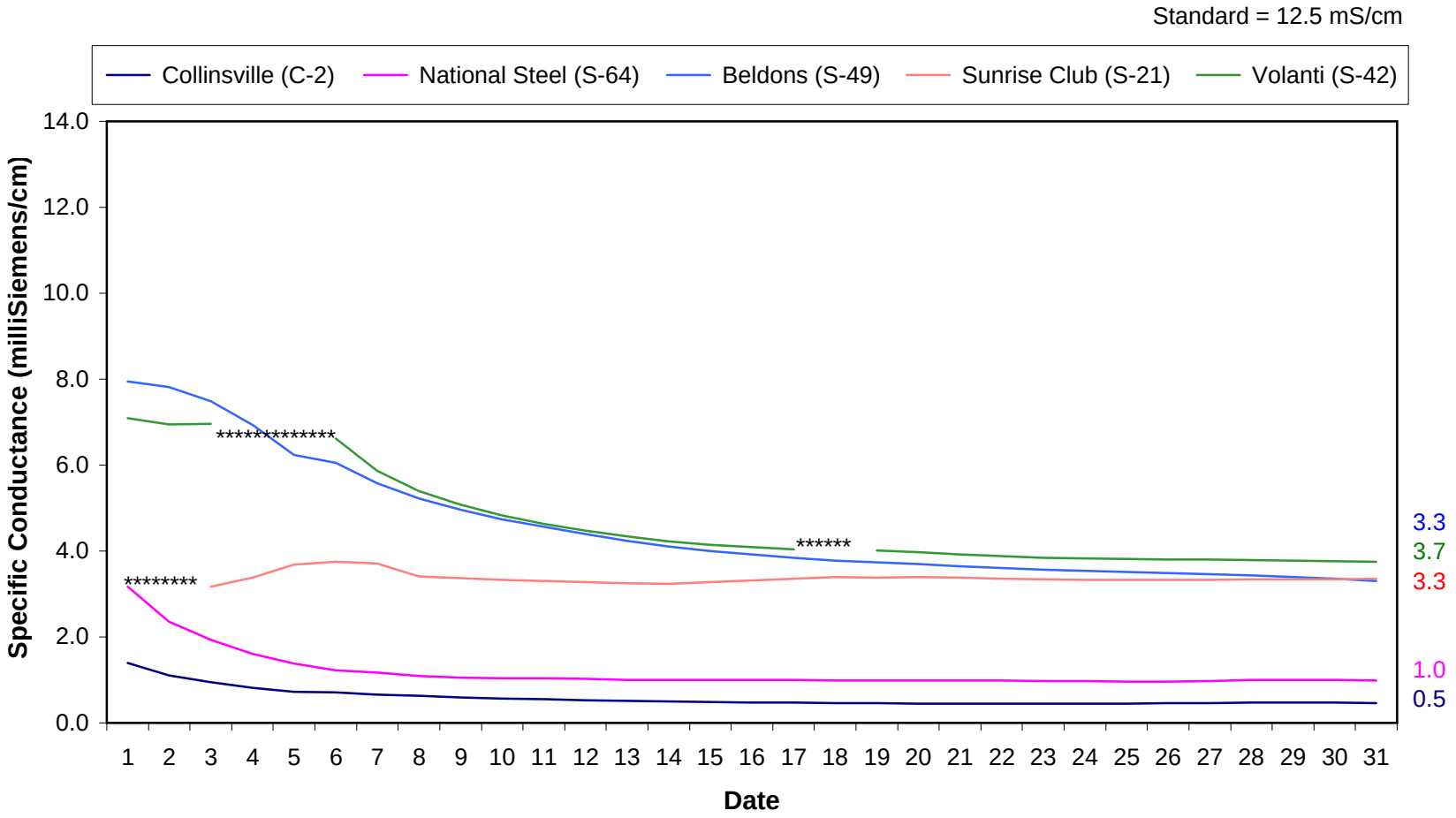
January 2005

Station	Specific Conductance (mS/cm)*	Standard	Standard meet?
C-2**	0.5	12.5	Yes
S-64	1.0	12.5	Yes
S-49	3.3	12.5	Yes
S-42	3.7	12.5	Yes
S-21	3.3	12.5	Yes

*milliSiemens per centimeter

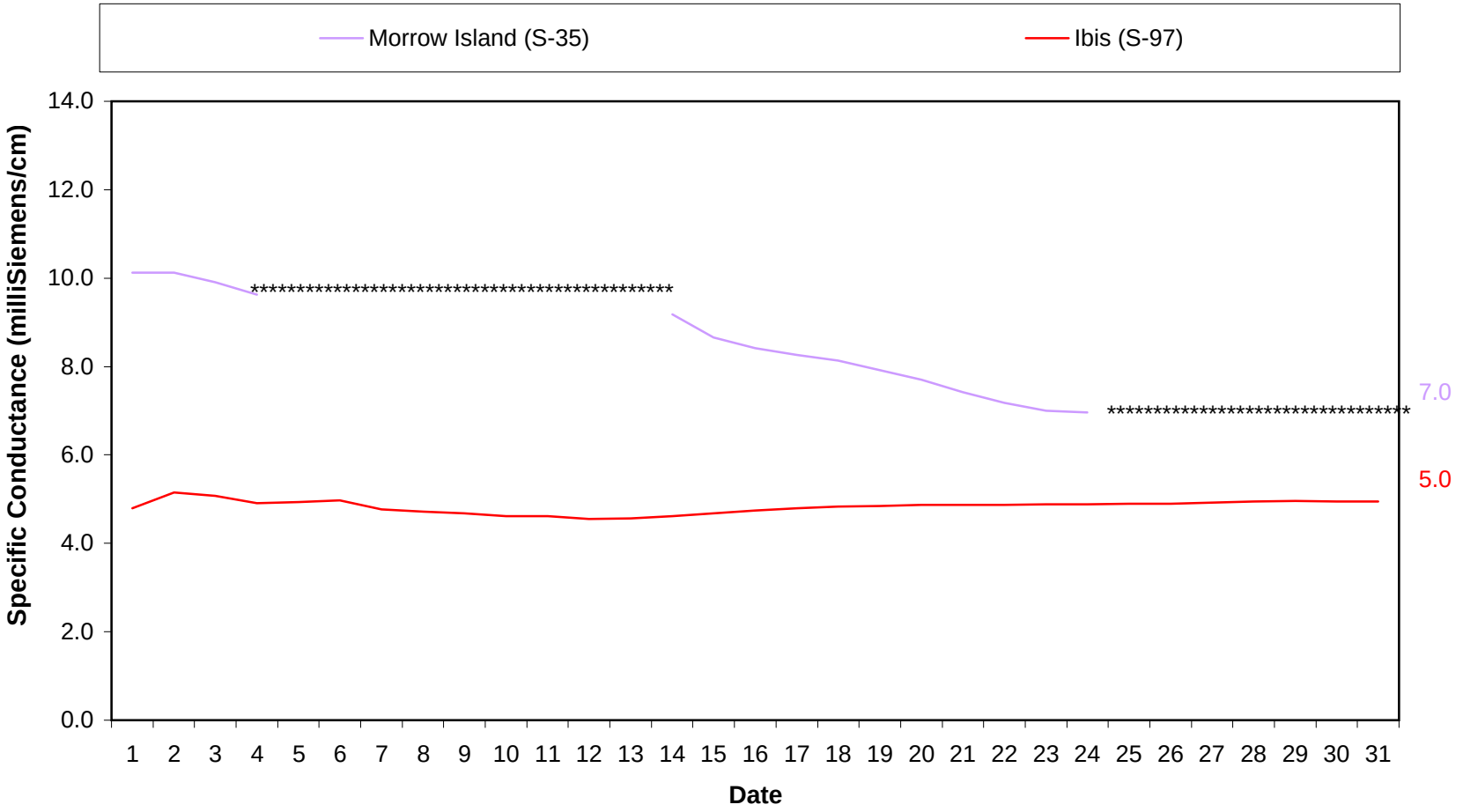
**The representative data from nearby USBR station is used in lieu of data from station C-2.

Figure 1. Suisun Marsh Progressive Mean High Tide Specific Conductance
January 2005



********** Data missing from S-42 and S-21 due to equipment problem.

Figure 2. Suisun Marsh Progressive Mean High Tide Specific Conductance
January 2005



********** Data missing from S-35 due to tide equipment
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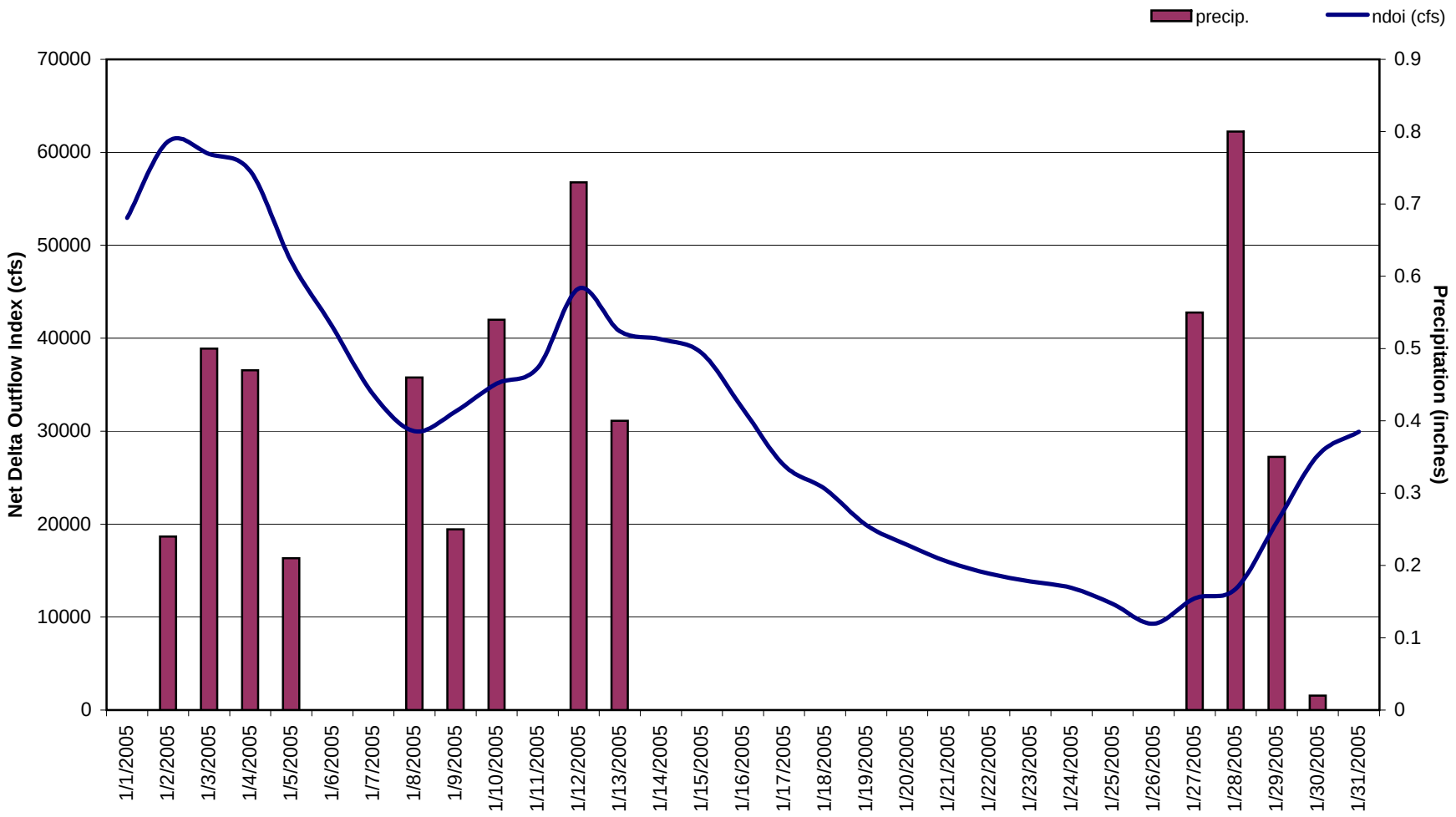
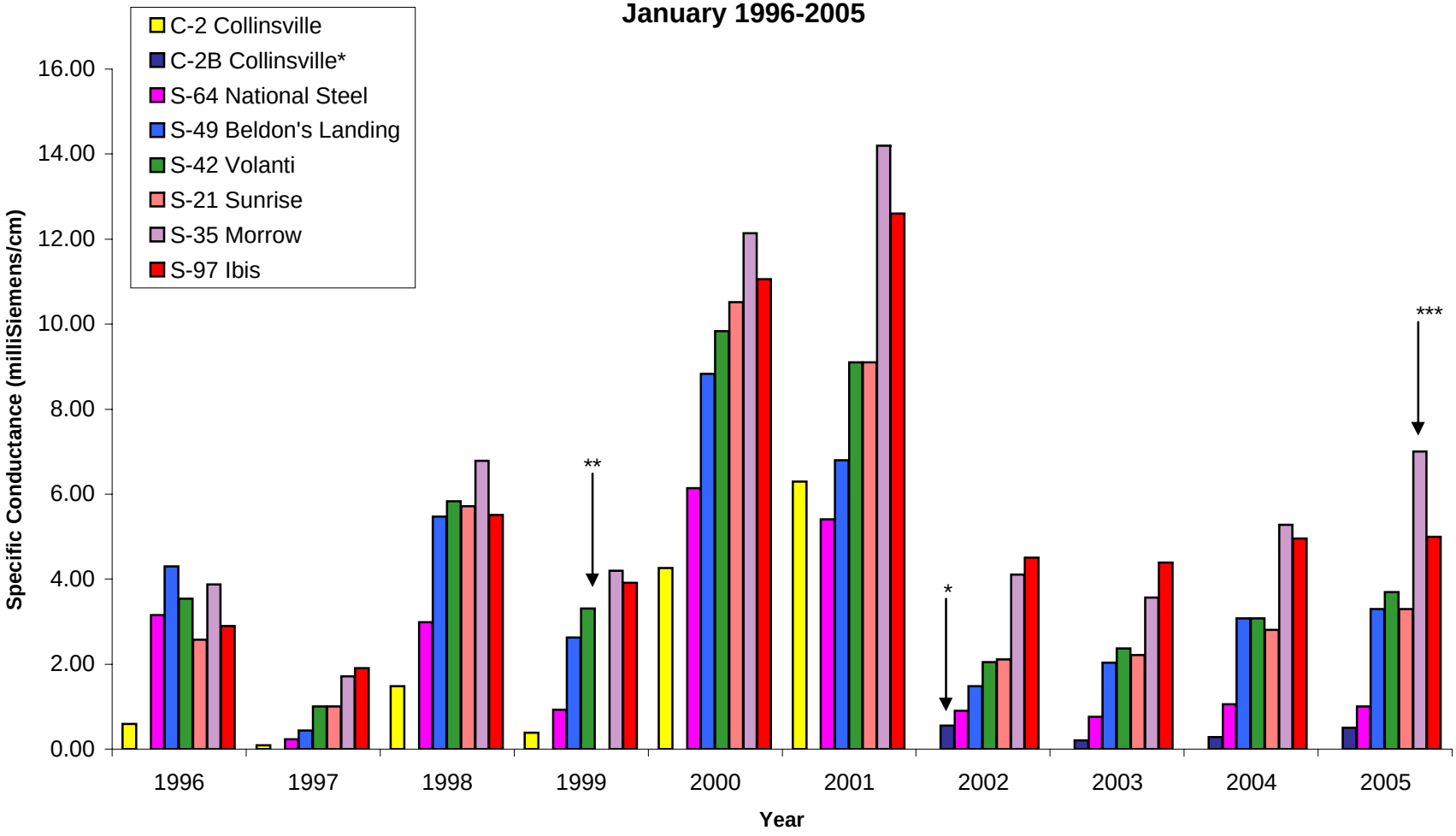
Figure 3. Daily Net Delta Outflow Index and Precipitation*
January 2005



*Preliminary DWR, O&M Delta Outflow data and precipitation from Fairfield Water Treatment Plant.

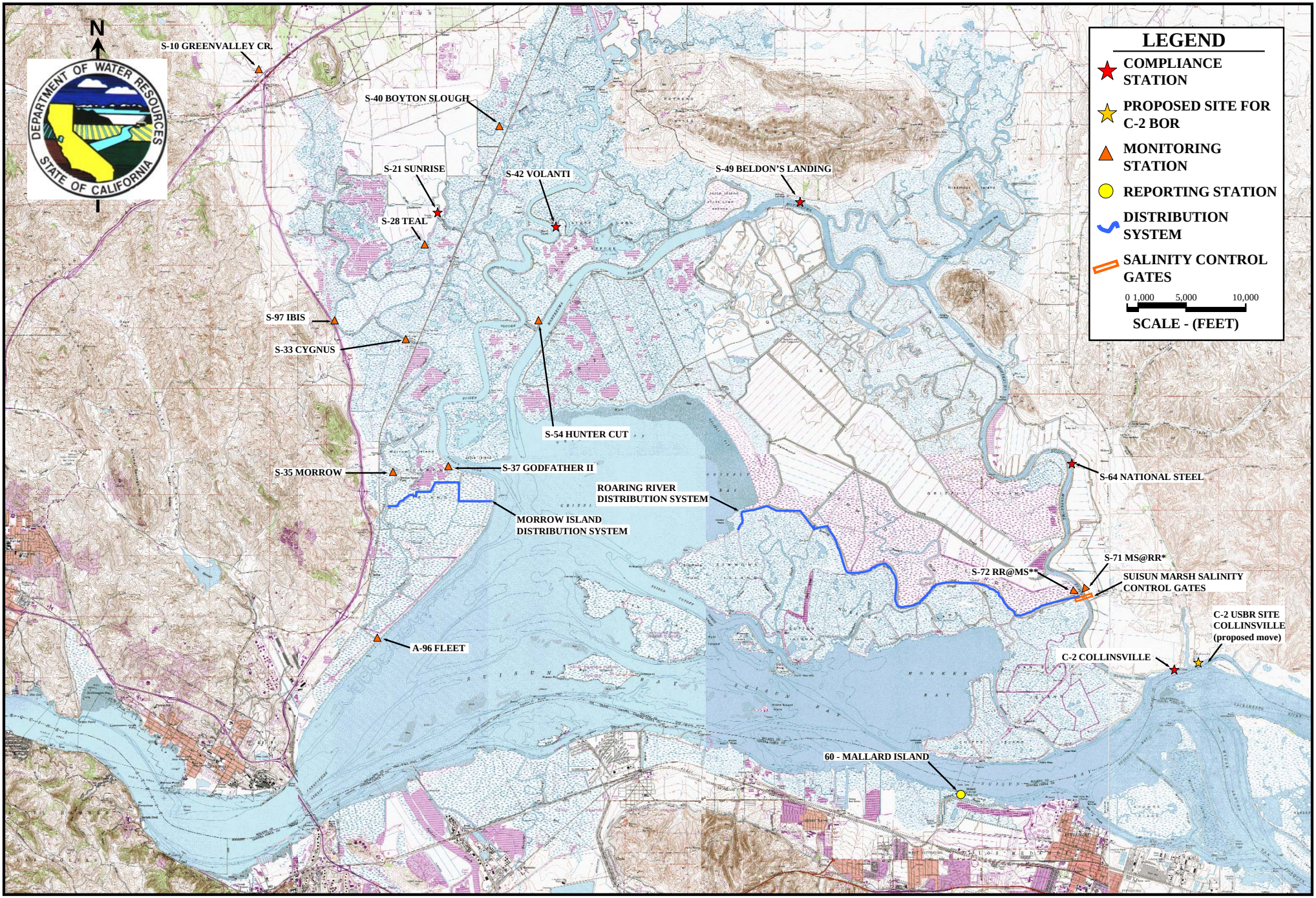
Figure 4. Monthly Mean Specific Conductance at High Tide: Comparison of Monthly Values for Selected Stations January 1996-2005



* = beginning in 2002.

** Data was not obtained due to equipment problem.

***Data not representative of end of month value due to missing data.



SUISUN MARSH PROGRAM WATER QUALITY MONITORING AND CONTROL FACILITIES